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A Brief of the Preliminary Land Use Planning Report of the Major Problems in Hand County

South Dakota State University Cooperative Extension

Special Extension Circular 51
December, 1940

A Brief of the Preliminary Land Use Planning Report of the

Major Problems in Hand County

"Son, we must take care of this land---
It will be yours someday."

EXTENSION SERVICE
South Dakota State College
Brookings, S. D.

Major Problems in Hand County

Discussed in the Preliminary Land Use Planning Report

*A review of the detailed 163 page preliminary report for Land Use Planning in Hand county indicates that the major problems at present are:**

1. Soil Use

a. Small isolated cultivated tracts in grazing areas interfere with grazing use in Area B-4.*
b. Too high a proportion of cropland—some of which is unfit for cultivation.
c. How to prevent further plowing of native grassland.

2. Taxation and Social Service

a. Unequable taxes on land.
b. Reorganization of community life to better fit changes in economic and social conditions.
c. Reorganization of school for improvement and economy.
d. Relief program.

3. Types of Farming

a. Sub-humid farming in semi-arid area.
b. To devise a farming system to produce a more stable farm income.
c. Lack of livestock feed and reserves.
d. Need for more livestock as readjustments are made under Problem No. 1 in Areas (B-1, E-1, and E-2) and better livestock.

4. Conservation of Soil and Water Resources

a. Overgrazing in Areas (B, B-2, -4, -5, -6), (E-3, -4) and (A).
b. Water utilization and conservation in Areas (B-2 & -5) (E-3).
c. Soil erosion.
   (1) Water (B-2) (E-3) (A), County.
   (2) By wind in Areas (B-1) (E, E-3).

5. Cultural Practices

a. Methods of seeding grasses and legumes.
b. Handling soil in Area E-3 for early farm operation.
c. Trees, planting, varieties, care, use, etc.

* For location of areas referred to by numbers, such as B-2, B-4, E-3 etc., see map on page 10.

6. Farm Finance

a. Credit for adequate livestock numbers.
b. Credit to conform to Agricultural Adjustment Policy, Feed and Seed loans.
c. Credit to assist in land ownership.

7. Tenure

a. Type of and length of lease and lease rate.
b. Ownership.

8. Size of Unit

a. Too many small units.
b. Adjust people to resources.

9. Farm Pests

a. Weed control, hoppers, disease.

10. Control Public Lands

The Committee

This booklet is a brief report of the more detailed preliminary report on land use planning in Hand county. The preliminary county report was correlated into one report from the various community committee reports. This job was done by the Hand county Agricultural Policy Committee. The members of the committee are:

Web. L. Davis, Chairman
A. M. McKay, Vice-Chairman
Mrs. L. B. Croll
Mrs. Chris Lanz
Alfred A. Syring
Mrs. Minnie Wicker
John Puffer
W. C. Hermann
A. M. Rowen
Chas. Gardner
John B. Heilman
Chas. Fischer
Art Hartman
Al Bohning
A. T. Burge

Foreword

The preliminary report of Land Use Planning in Hand county brings together the consolidated thinking of farm people on future Agricultural policies for the county.

It was impossible to print sufficient copies of the 163 page preliminary report of Intensive Planning for distribution to every farmer in Hand county. Therefore, this brief bulletin, which contains the "high lights" of the preliminary report has been substituted. It is in the nature of a progress report and is not in any way a definite, hard and fast procedure or presentation of facts. On the other hand this report is offered by the community committees and the county committee as important foundation truths. The members of these committees are willing and able to defend the progress they have made.

It is the sincere desire of all planning committee members to develop the best possible future agricultural policies in Hand county. With this thought in mind, they appreciate any suggestions which can be offered to gain this objective. The local planning committees appreciate and intend to make use of the assistance of local farmers, county administrators, the State College Extension Service and Experiment Station, and all state and federal agencies. The local committees fully realize that land use planning is a continuous process and that new and unusual economic and social problems must be met with new and unusual planning.

Acknowledgement

In Hand county, the intensive planning work has presented an opportunity for the farmers to pool their experience with the knowledge of agency administrators and technicians. One hundred twenty farmers and farm women served on the land use planning committees. A great deal of the credit for progress made in land use planning in Hand county is due to the efforts of these men and women. Following is listed the agencies who have contributed materially to assist the farmers in the land use planning work and to whom the Hand county Agricultural Policy Committee feels public acknowledgement is due:

Extension Service
Agricultural Experiment Station
Agricultural Conservation Program
Bureau of Public Roads
Prairie States Forest Service
Soil Conservation Service
Land Grant College-BAE Committee
Bureau of Agricultural Economics
County Offices
Farm Credit Administration
Farm Security Administration
Social Security Office
Works Progress Administration
Federal-State Agricultural Statistician

Origin of Land Use Planning in Hand County

Intensive land use planning, which is now being recognized as a very definite process for the coordination of the thinking of the farmer, the technician, and the administrator began in Hand county about April 1, 1939.

Hand county lies within the transition area of South Dakota and its problems are common to a large area in South Dakota.

The problems are interrelated and, as this report will show, combine climatic conditions, soil types, size of farm units, capability of both crop and grass land, together with social and economic problems still barely touched.

History of Hand County

Hand county lies in an area of extreme temperature changes which range from extremes of 110 degrees in the summer to 30 degrees below in the winter. The outside limits of the crop growing season are roughly April 10 and September 10. Farmers are of the opinion that the frost-free period is from May 10 to September 10. Rains in the early spring are of a slow drizzle type but during the summer are generally violent showers which pour down a large amount of water in a short period of time. Precipitation during the winters in the form of snow, blows and drifts into the valleys and low lands. It is largely lost through runoff when the spring thaws come. Crop production is dependent on a wide variation in precipitation from year to year, its accumulative effects and seasonal distribution.

When the Chicago and Northwestern railroad built through to Pierre in 1880, Hand county was an untried expanse of "raw" prairie. Nearly 60 years of agricultural experience since then has been characterized by instability almost equal to that of the climate.

The wave of settlement hardly passed the James river in 1881. That year, five townships were opened for settlement in Hand county and by January, 1882, 175 to 200 land filings had been made. By April, 1883, almost two-thirds of the land in the county had been filed upon, and by 1884 no significant amount remained open for settlement. There were as many as 100 farms in Howell township alone in 1883.

A disastrously dry year in 1886 forced the first of these periods of adjustment, driving out the bulk of the speculators along with many homeseekers whose "promised land" dried up. Those remaining then were the very hopeful, or those who had no means of departure.

Two years, 1887 and 1888, with fair and excellent crops respectively, brought in another group of bona fide homeseekers. This resulted in a fairly

select group of real farmers, fewer in number than 1883 and 1884, but sincere in purpose. But before they were well established there began in 1891 a series of dry years, mixed with a major depression lasting through 1897 and 1898.

But good years beginning in '99 brought more settlers. These newcomers broke up more land for grain farming, and worse, those with herds found themselves without adequate pasture and a substantial proportion of their owned land was already broken up for feed crops and cash crops. They were forced to reduce their herds against their better judgement, and to rely more upon grain farming with hogs as a major livestock enterprise, itself dependent upon grain.

The years 1914 to 1919 brought quite a radical change in Agriculture in Hand county. Due to the World War, which brought on an urge to increase production through both increased yields and increased acreages, farmers were induced to increase the cultivated land in Hand county from 213,000 acres to approximately 265,000 acres. During this period production of livestock was encouraged and the increase in hog numbers was outstanding.

The Present Agricultural Situation in Hand County

Hand county is composed of 40 townships lying within an area 30 miles east and west in width and 48 miles north and south in length. Approximately 1,325 farm families live on farm units ranging from 160 acres to 8,000 acres. The people of the northeast portion of the county practice quite expensive cropping systems while those in the west and south portions have a type of farm-ranch unit. Of a total of 912,640 acres in the county, approximately 435,000 acres are under cultivation, and about an equal amount in grass and hay. The usual planting of wheat, which is the major cash crop, is about 90,000 acres and 60 percent of this wheat is planted in approximately one-third of the county, which is the extensively cultivated area.

Livestock is found on nearly every farm, the number varying with the amount of land devoted to the production of feed crops and the amount of available pasture. The drought of 1934 and 1935 depleted livestock numbers throughout the county and the return of livestock has been slow due to the fact that local lending agencies were forced to restrict extension of credit. This restriction was necessary because of the lack of available feed supplies and good security. In 1938, 100,000 acres of idle farm land presented a problem in good farm management and demonstrated that there was an over-expansion during the war period.

There is a tendency at present by multiple land holders such as corporations, state agencies and individuals, to combine some farms in order to increase the size of farming units, thereby eliminating excessive overhead costs and making sufficient land available to each farm family to provide an ade-

quate income. This consolidation of farms has resulted in moving some and tearing down other farm buildings in order to use the material for the improvement of occupied farms.

This means that at the present time there are fewer farm homes and some of the local farmers are having difficulty in leasing well improved farms. This type of farm planning is conceived by the owners of the land on a pure dollar basis in order to protect themselves against excessive overhead.

A few disheartened farmers have, temporarily at least, abandoned the land. They have moved into neighboring towns and are now depending upon the public for their support.

Procedure Used in Organization

Selection of County Committee

The original membership of the county committee hereafter known as the Hand County Agricultural Policy Committee was selected at a joint conference of the county agent, AAA chairman, supervisor of the Farm Security Administration, chairman of the Board of County Commissioners, president of the County Extension Board and other individuals not directly connected with any federal, state or county agency.

The original 10 members selected have added five additional people to their group by consent of the entire committee.

The present membership is given on page 3.

Selection of Community Committeemen

A series of 12 meetings held at regular meeting places throughout the county brought together representation from each of the 40 townships. Following a general discussion meeting of the proposed intensified land use study, three farmers (in two instances, farm women) were elected from each township. (Townships hereafter are considered communities under land use planning.) The first member elected in each township was considered chairman and automatically becomes a member of the county committee, subject to call.

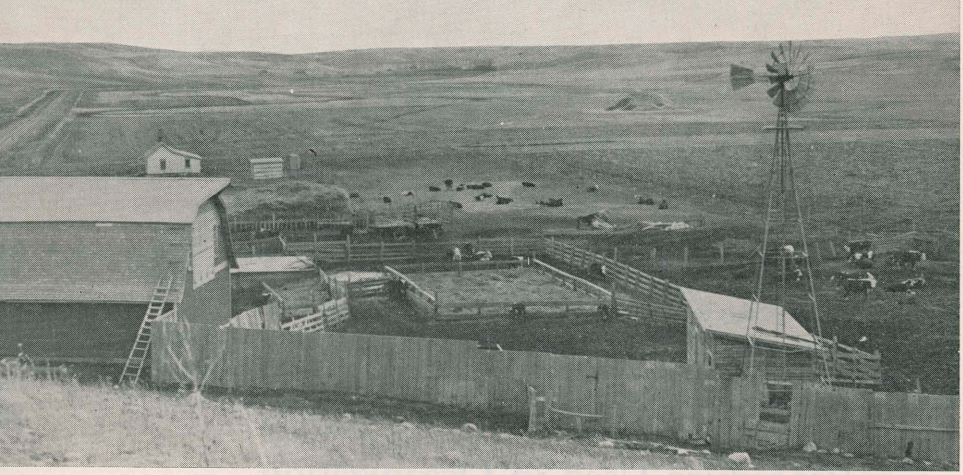
Land Mapping and Classification

Each of the 40 communities, meeting at one of the member's farm home, mapped their township according to the following procedure:

1. Main physical features.
2. Present land use.
3. Present land use problems.

The legend used to designate areas on maps is as follows:

1. Areas **now in farms** which are not suited to arable (dry) farming and in which the land should be put to some other use. (Labelled "A.")



A Hand county ranch typical of the type of agriculture toward which the land use planning committees are pointing in the B areas.

2. Areas **not now in farms** and which should not be in arable farms. (Labelled "B.")
3. Areas now in farms and which are questionably suited to arable farming. (Labelled "C.")
4. Areas **not now in farms** but which are suitable for development into farms. (Labelled "D.")
5. Areas now in farms and which should remain in arable farms. (Labelled "E.")

District Meetings For Coordination

In order to smooth out boundary lines between communities and differences in the reports of committeemen whose areas adjoin, eight district meetings were held at which four to six communities met for conference. The outcome of these conferences resulted in eight district maps and eight district reports.

Preliminary Report of Land Use Planning in Hand County

The Hand County Agricultural Policy Committee, sometimes called the County Land Use Planning Committee, made this report after a review of the district reports. The district reports were made at district meetings held in the eight districts. These district meetings, were to coordinate any differences between townships in any phase of the township reports.

It was then the purpose of the county committee to take the eight district reports, remove or correct any great differences between district boundaries and the district reports. From these findings the county committee made the following report, and prepared the map "Land Use Classification—1939" for Hand county which will be found on page 10 and which can be referred to in studying the following classified areas.

Report of B Areas Designated on Land Use Classification Map

A. General Description

All B areas designated in Hand county have one definite characteristic—20 percent or less of the entire area is under cultivation, or at least 80 percent of the entire area is in grass and hay land. However, since B areas in different parts of the county take on decidedly different characteristics as to physical features, size and in some instances land use problems, the committee decided to use eight sub-areas.

B. Specific Description and Recommendations by Areas

1. AREA B.

Area B lies in the northwest corner of Hand county, includes all of Harrison township, about one-third of Spring township and a limited area of Ontario township.

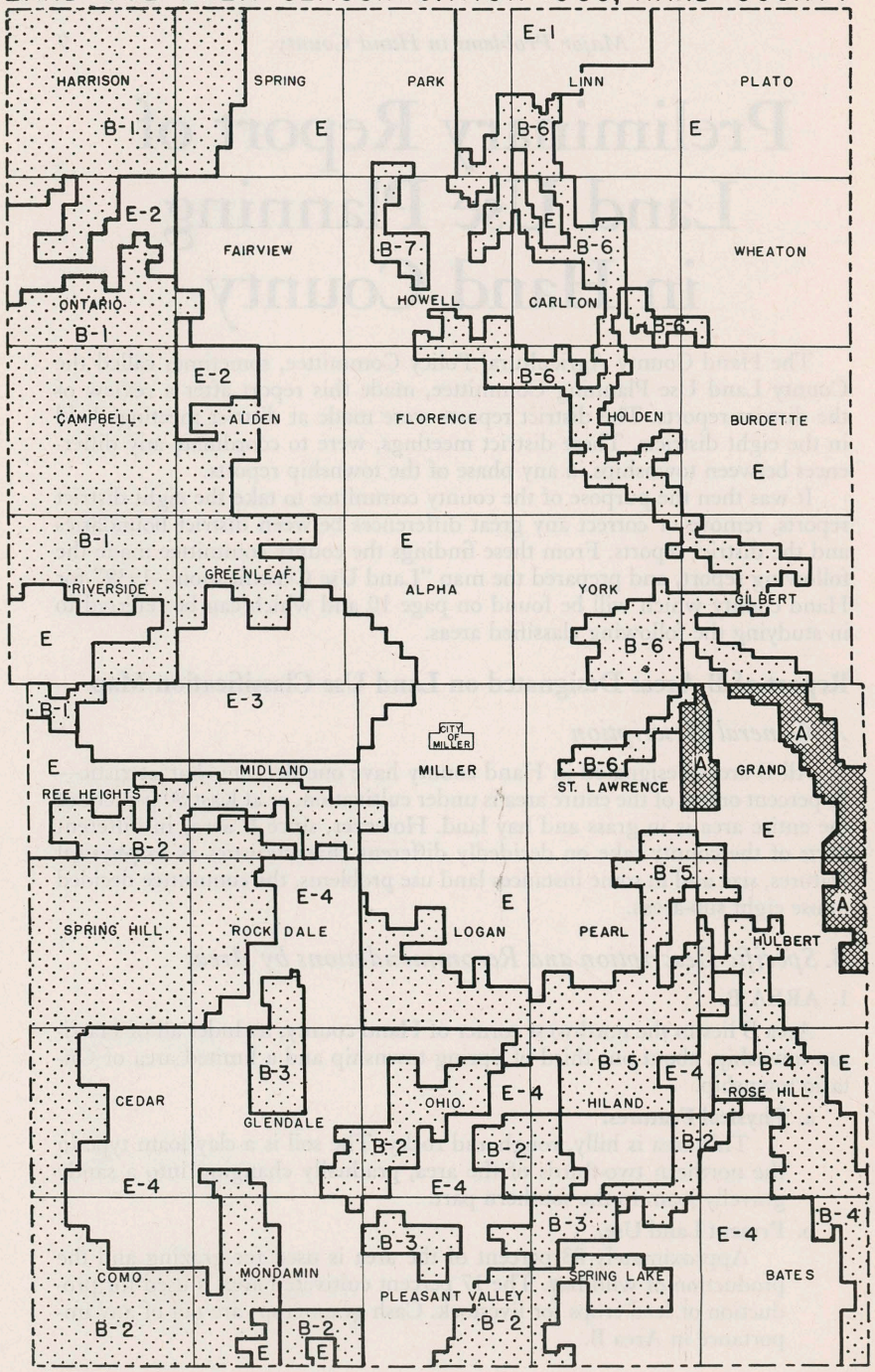
a. Physical Features.

This area is hilly, rough and rocky. The soil is a clay loam type in the northern two-thirds of the area, gradually changing into a sandy gravelly loam in the southern part.

b. Present Land Use.

Approximately 83 percent of the area is used for grazing and the production of wild hay. The 17 percent cultivated area is used for production of feed crops for livestock. Cash grain crops are not of any importance in Area B.

LAND USE AREA CLASSIFICATION-1939, HAND COUNTY



IN FARMS BUT UNSUITED TO ARABLE FARMING-AREA-A

NOT IN FARMS AND SHOULD NOT BE IN ARABLE FARMS-AREA-B

IN FARMS AND SHOULD REMAIN IN ARABLE FARMS-AREA-E

DEVELOPED BY TOWNSHIP COMMITTEES

CORRELATED BY THE COUNTY COMMITTEE

c. Present Land Use Problems.

A series of droughts have brought about over-grazing which in turn has made a shortage of summer pasture and winter feeding range. Insects have had an important part in the destruction of grass cover.

d. Recommendations.

Area B is to be used for the production of livestock. No additional land should be broken for cultivation purposes. The cultivated land should be farmed as recommended by the district committee—45 percent in small grains; 40 percent intertilled crops, 10 percent tame hays, and 5 percent contour fallowed. The recommendations as to size of unit; number of head of livestock and other pertinent information will be found on page 60, which is the county committee's recommendations for all B areas. The committee recommends long term leases for both cultivated and grass land in Area B. The committee also urges increased ownership of land by the operators.

2. AREA B-1.

Area B-1 comprises the south half of Ontario township, all of Campbell township, the north half of Riverside township and quite a large area in Greenleaf and Alden townships.

a. Physical Features.

Area B-1 is quite level land. In fact in the south half of Campbell and the north half of Riverside townships the area is so level it is poorly drained. All of the soil in this area is of a heavy type ranging from a heavy loam to a clay loam with typical gumbo spots. The subsoil is generally yellow clay, with some gumbo spots underlain with sand and gravel.

b. Present Land Use.

Area B-1 is suited for the production of livestock and the production of wild hay. The hay land in this area is level and free from stones, making the harvesting of hay an easy matter. The crop land is used for the production of livestock feed and some cash crops.

c. Present Land Use Problems.

Present land use problems are: Insufficient numbers of livestock; slight to severe wind erosion in limited areas; some difficulty experienced in securing an adequate water supply, and high taxes.

d. Recommendations.

Area B-1 is primarily a range area. The local committee in this area believes no more land should be broken for cultivation purposes. The present cultivated land which represents about 20 percent of the total area is recommended to be used as follows; 35 percent intertilled crops, 60 percent small grain crops, 5 percent tame hays. Summer fallow in this area has a tendency to blow and is not to be encouraged. The committee recommends long term leases to get away from the constant shifting of tenants. Area B-1 will take the same recommendations as to the size of unit and number of head of livestock recommended on page 22 for all B areas.

3. AREA B-2.

Area B-2 includes B areas in Ree Heights, Midland, Spring Hill, Rockdale, Cedar, Como, Mondami, Ohio, Glendale, Pleasant Valley, Spring Lake and Hiland townships. Area B-2 differs from Area B in that it is undulating to rolling, rather than hilly, although there are definite hills along the Elm Creek drainage system running through Spring Hill and Cedar townships.

a. Physical Features.

This area is undulating to rolling with a few hills. The hills border the Elm Creek drainage system and have outcroppings of rock. The undulating to rolling portion is covered with a good loam top soil and a clay sub-soil. Some of the crop land in the hilly area is subject to water erosion. Water erosion has little or no effect on the grassed slopes.

b. Present Land Use.

Livestock production and the production of feed for livestock constitute the major land use. Very little cash grain is grown in this area.

c. Present Land Use Problems.

Present land use problems are restoration of over-grazed pasture and the conversion of some cultivated land to the production of grass. The portion of this area lying in Rockdale township has experienced some difficulty in securing an adequate water supply.

d. Recommendations.

Area B-2 is recommended to be retained as an area primarily used for livestock production. No encouragement should be given to the production of cash grains since all of the good farm land should be used for the production of feed for livestock. The cultivated land in Area B-2 is recommended to be used at follows: 40 percent intertilled crops with considerable attention paid to drought resistant forage crops, and 50 percent into small grains. Ten percent of the cultivated land is recommended for the production of hay crops, such as sudan, millet, sweet clover and alfalfa.

Since a considerable portion of Area B-2 lies in the Crow Creek drainage basin, the committee recommends stock water dams and water spreading practices wherever possible. They urge the cooperation of the farmers and ranchers in this area in etablishing more adequate water facilities and the conservation of run-off water. Area B-2 takes the same recommendations as to size of unit, number of head of livestock and crop production as recommended for all of Area B, with the exception of percentage of small grains and intertilled crops.

4. AREA B-3.

Area B-3 has been set out because of the characteristic fact that this land is swamp land; lake beds producing hay, and lake beds producing little or nothing in the way of palatable feed. Incorporated within the boundary of these areas is some good hay land bordering the lake bed region. That portion of Area B-3 lying in the south part of Rockdale and the north part of Glendale

township is characterized by rolling land on which small lake beds or gumbo pot holes are quite prominent. This is good hay and grass land except where water stands a portion of the year. That portion of Area B-3 lying in Pleasant Valley township is almost entirely lake bed growing tall unpalatable grasses. However, there is one-half section of grass bordering the north side of the lake bed and almost a full section bordering the south of the lake bed. That portion of Area B-3 lying in Spring Lake township is of little value for the production of feed and pasture. The lake bed proper is covered with water nearly every spring and the growth which follows the disappearance of the water is weedy, coarse and unpalatable.

a. Physical Features.

Area B-3 lying in Rockdale and Glendale townships is level to undulating. The soil is swampy with a gumbo or clay top soil and a gravelly sub-soil. The area is poorly drained.

That portion of Area B-3 lying in Pleasant Valley is a typical lake bed formation surrounded by some good loam type grass land. The entire area is underlain with a clay sub-soil with a few gravel knolls bordering on the north.

That portion of Area B-3 lying in Spring Lake township is typical lake bottom surrounded by sloping areas well covered with native grass.

b. Present Land Use.

All B-3 areas are being used for pasture, hay land and waste land.

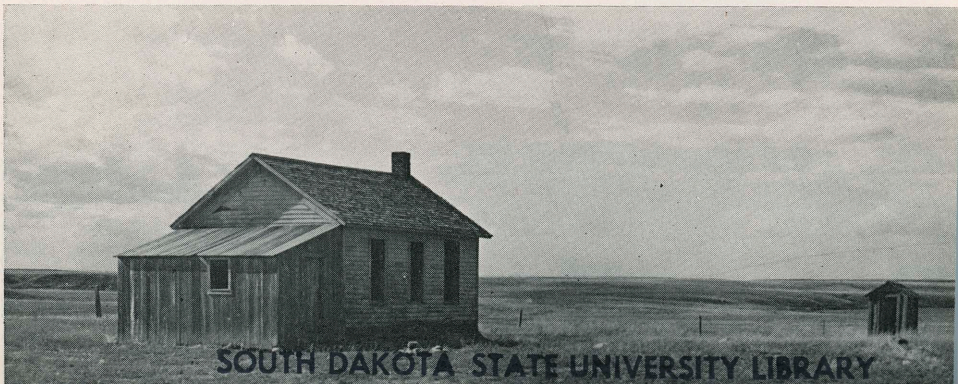
c. Present Land Use Problems.

Present Land Use Problems are costly drainage, heavy type soil, inclined to be stony.

d. Recommendations.

The committee recommends that all B-3 be considered suitable for hay and pasture only. No attempt should be made to drain the areas nor to cultivate the soil.

Abandoned school houses can be found in some of the B areas. Experience has shown that the number of families that can be supported in the B area is limited. When circumstances of Nature force some families to leave the area, then abandonment of community institutions, built to accommodate these families, naturally follows.



5. AREA B-4.

Area B-4 lying within Hulbert, Rose Hill and Bates townships is a definite range of hills bordered on the east by level bottom land and on the west by upland which is more or less rolling. Area B-4 is known as the Wessington Hills.

a. Physical Features.

Area B-4 is rolling to hilly. The soil is black loam, mostly yellow clay subsoil, some gravel pockets. The upper portions of the hilly areas are fairly well covered with stones.

b. Present Land Use.

The present land use is pasture and wild hay. Comparatively few entire farming or ranching units lie within the borders of this area, but it contributes grass and pasture to units lying in Area B-4, and the adjoining E areas.

c. Present Land Use Problems.

This area has been definitely over-grazed. There are small fields of cultivated land within the area which in the main are impractical and cause more or less trouble to owners of livestock.

d. Recommendations.

This area is definitely recommended for grazing and the production of wild hay. No additional land should be broken in the area and a considerable amount of the cultivated land now in the area should be restored to grass. While very few, if any, entirely operated units are within area B-4, the committee's recommended size and carrying capacity as set up for all B areas on page 22 would apply here.

6. AREA B-5.

Area B-5 has been set out since it contains a large amount of grass and hay land equal in type or nearly so, to the land that has been put into cultivated uses. That portion of the area lying in the southern part of Pearl and northern Hiland townships has some difficulty in securing an adequate water supply. This is probably a contributing factor in keeping the land for grazing purposes.

An abandoned township road and bridge in Area B-5. The tax money which maintained these facilities for a time apparently wasted. Land use planning can help avoid these mistakes in the future.

That portion of the area lying in Logan township is level to undulating but apparently has been in the hands of owners who considered this land as valuable for grass as for crop production. This condition is similar to northern Pearl township.

a. Physical Features.

This area is level and undulating; black loam soil with a clay subsoil. The entire area is more or less stony, however, not a serious drawback.

b. Present Land Use.

This area is devoted nearly entirely to hay and grass production. It is definitely recognized as a good grazing area. The cultivated land within this area is devoted to the production of feed crops with limited cash grain.

c. Present Land Use Problems.

There is some shortage of water in Pearl township which could be supplemented by stock water dams. Insects, especially grasshoppers, have injured the pasture grasses. Part of the area is over-grazed showing a need for deferred grazing and taxes are higher than the rental income on certain tracts of land within this area.

d. Recommendations.

The committee recommends that Area B-5 be considered suitable for the production of livestock and livestock feed. Any additional crop land broken in this area should be offset with an equal amount of seeding of perennial grasses. Area B-5 is subject to the same recommendations as to the size of unit, number of livestock and uses of crop land as recommended by the county committee on page 22 for all B areas.

7. AREA B-6.

Area B-6 differs from any other B area in that it shows evidence of an old geological drainage for the townships of Linn, Carlton, Holden, Gilbert and York; and the drainage at present runs at right angles to this older drainage. The area is considered a community hay and pasture area utilized by farming units lying in the E areas bordering it. Very few, if any, farm units lie within the borders of this area but the area does contribute to all the units which lie adjacent.

a. Physical Features.

This area is level with slight slopes along the borders. The soil is of heavy clay type generally underlain with clay with outcropping of gravel or an occasional gravel pocket. The area is poorly drained and during the wet season contains many ponds or lakes.

b. Present Land Use.

The present land use is for pasture and hay. Since the soil is heavy, it produces excellent hay, especially in that portion of the area covered with water a part of the time. As previously stated this area is a community pasture and grass area, and is considered quite valuable to that community.

c. Present Land Use Problems.

Over-grazing is quite apparent in this area. Even the land which was used for hay has been forced into the grazing unit and shows the effects of too much livestock. During the expansion period of Hand county between 1914 and 1930 farmers encroached on this area and broke up land having a heavy top soil and too poorly drained to be suitable for cultivation.

d. Recommendations.

It is recommended that deferred grazing be practiced on all area B-6. It is further recommended that any of the cultivated land bordering this area which is typical of the area in the matter of soil and drainage should be placed in a restoration program and returned to grass as soon as possible.

Area B-6 does not contain entire farming units but contributes to units made up of B and E areas; therefore, the recommendations for B areas in the matter of size of farms and number of head of livestock recommended by the committee on page 60 do not apply.

8. AREA B-7.

This area lies almost entirely within Howell township and differs from that portion of Area B-6 lying in the same township. B-7 is characterized by an undulating to rolling surface, some of which might be farmed but because of the wishes of owners has been retained for the production of grass and used as pasture.

a. Physical Features.

This area is undulating to rolling with black loam soil and a clay subsoil. This area is well drained and contains some stones.

b. Present Land Use.

This area is used for pasture and the production of wild hay.

c. Present Land Use Problems.

There are no present land use problems of any note.

d. Recommendations.

It is recommended that this area be maintained for hay and pasture use. No additional land in Area B-7 should be broken since it makes a valuable contribution to the farm units surrounding and located in E areas. Recommendations for size of farm, number of livestock, division of crops set up by the committee on page 22 do apply to this area.

Report of E Areas Designated on Land Use Classification Map

A. General Description

All E areas may be described as level to rolling, a loam top soil varying in depth from 8 to 14 inches, underlain with yellow clay. E areas contain approximately 70 percent of the cultivated land in Hand county. The area has been divided into five sub-areas due to slight differences in top soils, sub-soils and other physical features, the E area contains from 40 per-

This comfortable home in Hand county represents the level of living that the planning committees in the E areas have in mind as a desirable goal toward which their planning efforts are directed.

cent to 50 percent grass land, a considerable part of which is similar to the land under cultivation.

The agricultural problems of the E areas are not confined to problems of soil management but include economic and social problems.

B. Specific Description and Recommendations by Areas

1. AREA E.

Area E is the largest of the E areas and covers the northeast and north central part of the county. The only interruption in the area E is a long narrow drainage basin shown on the "Land Use Classification" map as area B-6 found on page 10.

a. Physical Features.

This area is level to undulating with a black loam top soil ranging from 8 to 12 inches in depth which is underlain with a yellow clay subsoil except in that portion of the area bordering Area B-6 where there may be found sub-soils of a sandy or gravelly type. This type of subsoil mentioned last is found in spots and is not uniform, even in the land bordering area B-6. The area is almost free from stones and is well drained.

b. Present Land Use.

Approximately 50 percent of area E is under cultivation. In the townships of Wheaton, Burdette, Gilbert and Grand the percentage of cultivation will approach 50 percent. The area is used for the production of livestock, livestock feed and a large amount of cash grain, mostly wheat. Prior to 1934 the area produced a large amount of corn. Since 1934, 30 percent of the corn land has been utilized for the production of drought resistant crops, mostly forage and grain sorghums. The grass land which represents about 50 percent of the farm unit is used for pasture and the production of wild hay.

c. Present Land Use Problems.

Scattered over area E are idle fields apparently the result of overexpansion in cultivated land during the World War and the years immediately following. Idle ground is the breeding ground of weed seed

and troublesome insects. A limited area in Grand township is subject to blowing.

Due to low production during the last seven years taxation has become excessive and presents a problem to land owners. Land in Area E carries the highest assessed valuation of any land in Hand county.

d. Recommendations.

Area E is definitely a diversified farming area with the production of livestock receiving considerable attention. Cash grains, mostly wheat should be a part of the farm plan, but no additional land should be broken to increase the production of these cash crops.

Area E takes the recommendations as to size of farm unit, number of head of livestock and crop acres set up by the county committee on page 22.

2. AREA E-1.

a. Physical Features.

Area E-1 differs from Area E in that the land is undulating to rolling and contains considerable stone. The type of soil and sub-soil is similar to Area E. **Present land use and present land use problems** are the same as in Area E.

3. AREA E-2.

a. Physical Features.

This area is undulating to rolling with some level land. The top soil is black loam ranging from 8 to 10 inches in depth. In the northern part of Area E-2, the loam soil may contain considerable sand changing the classification to a sandy loam. The small portion of the southern edge of Area E-2 is of a clay loam type. The sub-soil under the entire area is yellow clay. The **present land use** and **present land use problems** are the same as in Area E.

4. AREA E-3.

a. Physical Features.

Area E-3 is level. The top soil is of a heavy clay loam type. The drainage is to the north and east and during the spring months the run off water from the Ree Hills often covers a large part of this area. While the drainage is adequate, it is slow, even to the extent of causing delayed farming operations.

b. Present Land Use.

Fifty percent or more of this area is in cultivated crops. The area is well adapted to the production of grass and pasture. The production of crops in Area E-3 is affected by excessive moisture and long periods of drought. Under ideal moisture conditions this is a high producing area.

c. Present Land Use Problems.

The heavy type soil in this area is hard to manage. It is now recognized by some operators in the area that the land should have been left

in the native grass condition which now presents a problem in reseeding and restoration. The grass land in this area is over-grazed.

During the last seven years approximately 30 percent of the cultivated land has been idle. That portion of area E-3 lying in Midland township is subject to wind erosion and control methods are necessary. Area E-3 contains the drainage system carrying the water out of the Ree Hills northward. The large amount of water running off during a short period in the spring months has caused serious water erosion along the drainage channels.

d. Recommendations.

With few exceptions area E-3 should be used for the production of native and tame grasses. It is suited for this use and does present a problem when under cultivation. The present acreage of grass land should be deferred and restored to a higher state of production. No additional land should be broken in this area.

There are a few exceptionally good producing farms which should retain their present land use.

5. AREA E-4.

Area E-4 comprises a large amount of cultivated land lying in a number of irregular areas. The townships in which E-4 land may be found are Midland, Rockdale, Cedar, Glendale, Como, Mondamin, Ohio, Pleasant Valley, Hiland, Spring Lake, Hulbert, Rose Hill and Bates. The area is composed of cultivated land which may be found in quite large tracts completely surrounded by hilly land or may be found in rather narrow tracts surrounded by an area of undulating to rolling grassland.

a. Physical Features.

This area is level to undulating containing some stones. The soil is of a loam to silt loam type, underlain with yellow clay. Drainage in this area is adequate, there being two drainage channels, the Elm Creek and Spring Lake, both of which are a part of the Crow Creek Drainage System and which becomes quite extensive in the counties to the south.

b. Present Land Use.

That portion of area E-4 lying in Midland, Rockdale, Cedar, Como, Glendale and Mondamin is devoted principally to the production of feed grains since this portion of Area E-4 contributes to the support of the B areas surrounding. The remaining portion of the E-4 area produces both feed crops and cash grain crops, although cash crops produced in Area E-4 are not of as great importance as the cash crops produced in the E area to the north. Livestock production is of great importance in this area.

c. Present Land Use Problems.

The grass land found in Area E-4 is over-grazed but did show some comeback in 1939. There is too much cultivated land in this area and it it is found bordering the B areas wherein, due to expansion pressure,

The results of land abuse in Area-A.

operators have come onto the rougher unsuited land to increase their crop acres.

d. Recommendations.

Area E-4 is subject to the same recommendations as to size of farm unit, number of head of livestock and farm management practices set up by the county for all E areas and found on page 22 of this report. It is recommended that no additional land be broken for cultivated purposes; that there be an increase in alfalfa and sweet clover acreage as soon as moisture conditions warrant; that the land designated for restoration purposes be the only land accepted for restoration practice payments and that grass seeding be required on this land.

Report of A Area Designated on Land Use Classification Map

A. General Description

This area lies in parts of St. Lawrence, Grand and Hulbert townships. The area is similar to B area except more than 20 percent of the land is in cultivation, and community committees in the above mentioned townships state that a great deal of the cultivated land should be restored to grass.

B. Specific Description and Recommendation by Areas

1. Area A.

a. Physical Features.

Level to undulating; gravel knolls. Loam to clay loam with gumbo pot holes. Clay sub-soil in part. Other areas underlain with gravel directly under top soil. Drainage not too good—water will stand in low spots for considerable time.

b. Present Land Use.

Forty percent of area under cultivation. Production of cash grain and feed crops. Sixty percent used for pasture and hay. Limited production of livestock.

c. Present Land Use Problems.

a. Excess land under cultivation (unsuitable).
b. Difficulty in restoring crop land to grass.
c. Poor drainage in parts.
d. Over-grazed grass land.

d. Recommendations.

The committee recommends:

1. Seeding of all areas designated for restoration with seeding of perennial grasses.
2. Limiting soil depleting and wheat bases on this land under the Agricultural Conservation Program.
3. Encourage production of more livestock.

Recommended Farm Units

Livestock and Equipment Set-up for B and E Areas

Note: With a great deal of uncertainty the Hand County Agricultural Policy Committee ventures to propose a size of farm unit as ideal for all B areas and another farm unit as ideal for all E areas. The committee recognize the "human equation" is left out. Good management or the lack of management will change the entire set-up. The proposed units are standards to strive for and not concrete examples of perfection.

The Hand County Agricultural Policy Committee through its sub-committee of three members is proposing the following farm units for the respective areas, using the same considerations for each area.

Considerations

Operator owns one half of the land and rents one half.
Operator has 50 percent equity in livestock.
Operator owns all equipment.
Land in Area B valued at $7.50 per acre.
Land in Area E valued at $12.50 per acre.
Land rented in Area B for taxes.
Land rented in Area E for taxes.
Interest rates at 6 percent.
Livestock valued at market price.
Grain production, 15 year averages.
Roughage production, 1 ton per acre.

AREA E FARM SET-UP

960 acres.

384 acres cropland. (40 percent)

576 acres grass land. (60 percent)

Average number of 12 months period: 50 cattle; 80 sheep; 4 horses; 48 hogs; 150 poultry; 1 tractor with tractor equipment.

384 acres crop land.

50 percent intertilled; 50 acres cane; 42 acres grain sorghum; 100 acres corn.

50 percent close drilled: 70 acres wheat; 40 acres barley; 20 acres oats; 40 acres tame hay; 22 acres rye.

Area B Farm Set-Up

1500 acres.

1200 acres pasture and hay land. (80 percent)

300 acres crop land. (20 percent)

Average number for 12 months period: 70 cattle; 100 sheep; 36 hogs; 6 horses; 150 poultry.

33⅓ intertilled: 40 acres cane; 60 acres corn.

66⅔ percent close drilled: 40 acres tame hay; 70 acres barley; 60 acres oats; 30 acres rye.

The committee expects each area unit to utilize crop stubble for sheep pasture relieving the grass pasture to some extent.

Classes of Land According to Use Capability

The Hand county Land Capability map on the back cover of this publication was prepared through cooperation with the Soil Conservation Service. Basic information to classify the land was gathered by the SCS; first, generally for the entire county, and next, in detail for Holden township to illustrate the method to be used in planning operations of farm unit size.

The reconnaissance survey of the entire county had two purposes: To supply the County Planning committee as much information as possible with available time and personnel; and to illustrate the method of securing information on large areas essentially suited to range with little land suitable for cultivation.

The black, dotted or cross-hatched portions of the map result from a study and summary of physical factors of soil, slope, erosion and climate. Economic factors of farm organization were also considered. Separating the land into various classes, each based on the highest permanent use of individual areas, was the method used to interpret the technical information into form easily understood by those who plan to use the land. Discussion of the four classes shown on the map follows.

Suitable for Cultivation with Simple Practices. This land is considered suitable for safe and permanent cultivation of adapted crops providing that simple practices to control erosion and conserve moisture are followed. An example of such practices is "control of plant residue." Plant residues left on the ground greatly add to the soil's ability to soak up rainfall.

A soil cover will also prevent wind erosion and hinder evaporation. This residue when left on or near the top of the ground will also add to the humus (plant food) more rapidly than if plowed under deeply.

This class of land is level to undulating having slopes of less than 3 percent. It is free of injurious salts, large stones or other obstacles to cultivation. It is moderately susceptible to wind erosion and its production of adapted crops is moderate to high. Soil types found are: Barnes loam and silt loam, Williams loam and silt loam, Reliance silt loam, Edgeley loam, silt loam and Bearden silt loam.

Suitable for Cultivation with Intensive Practices. This land is suited for cultivation but requires intensive practices to prevent erosion and conserve moisture. Wind erosion is about the same as in the previous class but because of its steeper slopes 4 to 8 percent of it is susceptible to sheet erosion. It will also produce good yields of adapted crops. Since moisture conservation and erosion control are more difficult here, such practices as contour strip cropping are needed to prevent runoff and keep the soil in condition to produce moderate to high yields.

Cultivating up and down slopes induces rapid runoff, removing topsoil containing the sponge-like humus. Topsoil removal results in loss of fertility and water-holding ability. If continued, this loss will be so great as to lower productivity to the point where cultivation will no longer pay.

The amount of sheet erosion is in direct proportion to the slope because the steeper slope increases the velocity of escaping water allowing it to carry away more soil. Soils are also shallower on steep land and are more quickly damaged by topsoil. Sheet erosion is not yet serious in Hand county but the slight loss already seen can be greatly reduced by simple practices.

Soil types found in this class are: Barnes loam and silt loam, Williams loam and silt loam, Boyd, Williams, Edgeley and Reliance loams and clay loams, all on 4 to 8 percent slopes.

Primarily Suited to Grazing. This area is not suited for cultivation and may be best used for grazing. The highest use of the land will be found when the soil is under a permanent grass cover. The main reason for placing this land in the grazing class is because it is highly susceptible to erosion because of its steep slopes and sandy soil. Alkali salts and extreme stoniness were also considered.

Some soils may be farmed safely on steeper slopes than others depending much on how quickly they can absorb water and the amount of rainfall available. Generally speaking, it is not practical to farm Hand county soils having a slope greater than 9 percent. Terracing and other intensive mechanical measures may retard runoff and prevent erosion but it is too expensive for the production which might be expected.

Soils in this region are Williams, Reliance, Edgeley and Boyd on the 9 percent and greater slopes. Parnell clay with practically level topography is placed in this class because it is very heavy, subject to severe cracking and drouth. Sioux loam and sandy loam can stand very little drouth, with the exception of minor areas with high water tables.

Intermittent Ponds and Waste Land. This land has very low grazing value and is practically waste land. In Hand county it includes potholes or low spots in which water limits plant growth to weeds and unpalatable water plants. This land class is limited in Hand county.

The benefits to be derived from proper classification of land are self evident. A glance at a classification map will indicate the maximum intensity of agriculture which may be practiced safely in any area. Such classification should facilitate all types of land planning and treatment. It provides basic information for evaluating and adjusting taxes. It indicates suitable restoration areas and affords a sound basis for readjustment of misused land. Its foremost objective is to aid and promote a sound and lasting agriculture.

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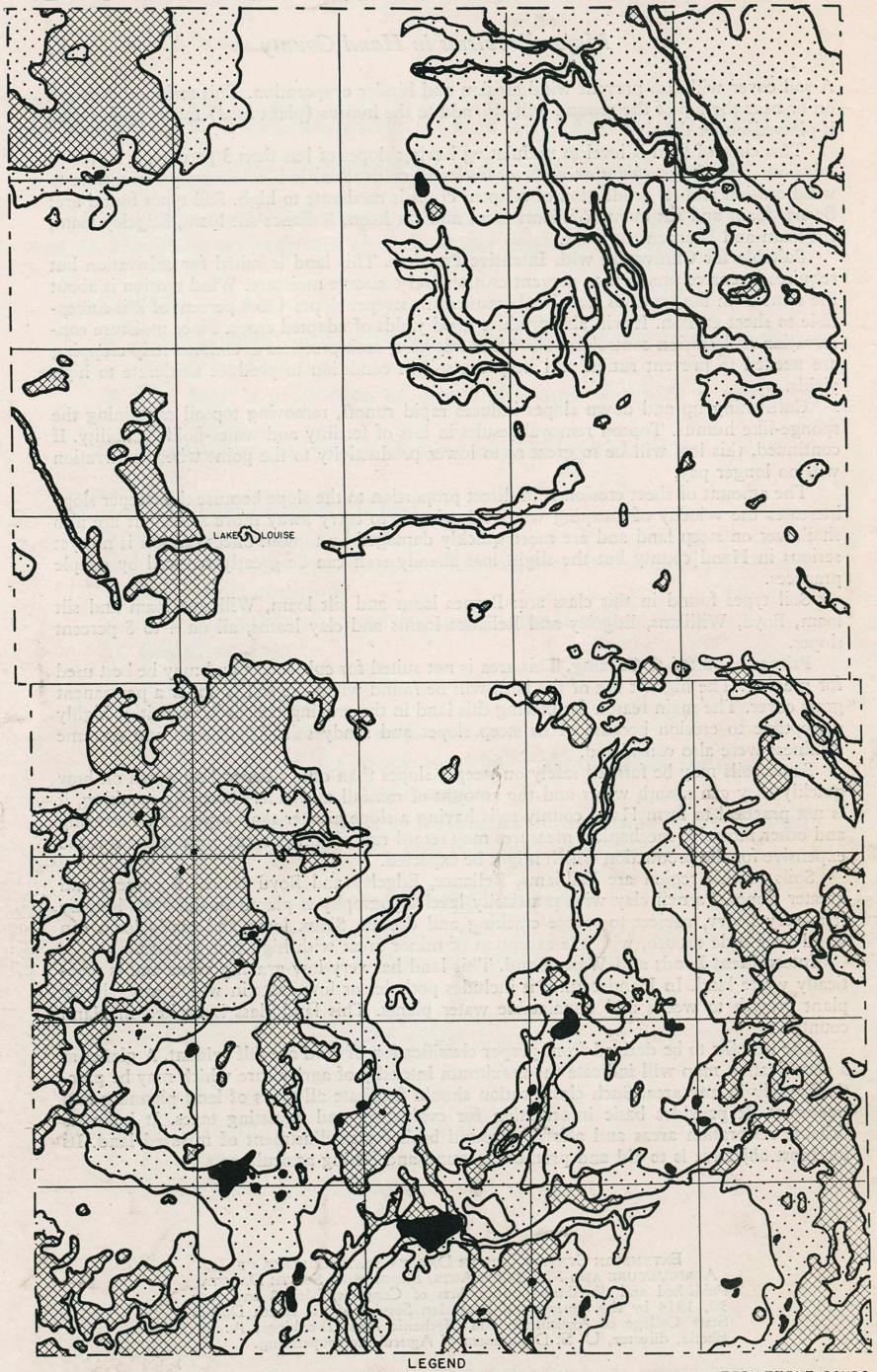
LAND CAPABILITY CLASSIFICATION - HAND COUNTY



LEGEND

- SUITABLE FOR CULTIVATION WITH SIMPLE PRACTICES
- SUITABLE FOR CULTIVATION WITH INTENSE PRACTICES
- PRIMARILY SUITED TO GRAZING
- INTERMITTENT PONDS AND WASTE LAND

SOURCE: RECONNAISSANCE SOIL SURVEY - 1939; SOIL CONSERVATION SERVICE U.S.D.A.